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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,100	09/09/2003	Tina J. Wagner	FIS920030249US1	2099

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INTERNATIONAL BUSINESS MACHINES CORPORATION
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EXAMINER	
VU, DAVID	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/605,100	WAGNER ET AL.	
	Examiner	Art Unit	
	DAVID VU	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03/29/05* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 21-28 and 40 are rejected under 35 U. S. C. 102(b) as being anticipated by Gilton et al. (US Pat. 6,143,611, herein after Gilton).

Gilton discloses in figs. 5-7 a FET device comprising: a substrate 32 with a top substrate surface upon which a gate electrode stack is formed; gate electrode stack (col. 3, line 62 through col. 4, line 1) comprising: a polysilicon gate electrode 34 formed over a gate dielectric layer 33, gate dielectric layer 33 being formed on top substrate surface 32; polysilicon gate electrode 34 having a top polysilicon gate electrode surface and having polysilicon gate electrode sidewalls; sidewall spacers 50 formed on gate electrode sidewalls aside from polysilicon gate electrode 34; a cap layer 35 having outer edges and a top formed on top polysilicon gate electrode surface; a hard mask 39 formed on top of cap 35; notches formed in outer edges of cap layer 35 recessed from polysilicon gate electrode sidewalls; notches in outer edges of cap layer 35 being filled with protective plugs 50 formed on top of polysilicon gate electrode layer 34 (col. 5, lines 11-33); and sidewall spacers 50 reaching along polysilicon gate electrode sidewalls to above a level at which

protective plugs 50 contact polysilicon gate electrode 34 whereby sidewall spacers 50 are contiguous with and overlapping protective plugs 50 covering sidewalls of gate electrode 33 and a raised source/drain region 60/64 on top of said silicon layer 32 aside from spacers 50 (col. 5, lines 42-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 29-39 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Gilton (US Pat. 6,143,611) in view of Chang et al. (US Pat. 6,030,863, herein after Chang).

Gilton discloses in figs. 5-7 a FET device comprising: a substrate 32 with a top substrate surface upon which a gate electrode stack is formed; gate electrode stack (col. 3, line 62 through col. 4, line 1) comprising: a polysilicon gate electrode 34 formed over a gate dielectric layer 33, gate dielectric layer 33 being formed on top substrate surface 32; polysilicon gate electrode 34 having a top gate electrode surface and having gate electrode sidewalls; sidewall spacers 50 formed on gate electrode sidewalls aside from gate electrode 34; a cap layer 35 having outer edges and a top formed on top gate electrode surface; a hard mask 39 formed on top of cap 35; notches formed in outer edges of cap layer 35 recessed from gate electrode sidewalls; notches in outer edges of cap layer 35 being filled with protective plugs 50 formed on top of gate electrode layer 34 (col. 5, lines 11-33); and sidewall spacers 50 reaching along polysilicon gate electrode sidewalls to above a level at which protective plugs 50 contact gate electrode 34 whereby sidewall spacers 50 are contiguous with and overlapping protective plugs 50 covering sidewalls of polysilicon gate electrode 33 and a raised source/drain region 62/64 on top of said silicon layer 32 aside from spacers 50 (col. 5, lines 42-47).

Gilton fails to disclose the cap layer is an amorphous silicon layer formed of germanium and silicon ions. However, Chang teaches amorphous silicon/amorphous silicon-germanium is used for the gate electrode material (col. 5, lines 12-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Gilton by using the gate electrode material as taught by Chang, in order to increase the conductivity of the gate electrode (See Abstract).

Response to Arguments

3. Applicant's arguments filed 08/29/05 have been fully considered but they are not persuasive.

Applicant argues that the Gilton does not teach forming a notch in the polysilicon. It is noted that this limitation is not found in the claims. Gilton, as indicated in the above rejection, clearly discloses claimed features (i.e., notches formed in outer edges of cap layer 35 recessed from gate electrode sidewalls; notches in outer edges of cap layer 35 being filled with protective plugs 50 formed on top of gate electrode layer 34) (col. 5, lines 11-33).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Vu

November 07, 2005.